



\*\*FILE\*\*ID\*\*MTHMFLOOR

C 1

MM MM TTTTTTTTTT HH HH HH FFFFFFFF LL 000000 000000 RRRRRRRR  
MM MM TTTTTTTTTT HH HH HH FFFFFFFF LL 000000 000000 RRRRRRRR  
MMMM Mmmm TT HH HH HH FF LL 00 00 00 00 RR RR  
MMMM Mmmm TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM TT HHHHHHHHHH HHHHHHHHHH FFFFFFFF LL 00 00 00 00 RRRRRRRR  
MM MM TT HHHHHHHHHH HHHHHHHHHH FFFFFFFF LL 00 00 00 00 RRRRRRRR  
MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM TT HH HH HH FF LL 00 00 00 00 RR RR  
MM MM TT HH HH HH FF LL 000000 000000 RR RR  
MM MM TT HH HH HH FF LL 000000 000000 RR RR  
MM MM TT HH HH HH FF LLLLLLLL 000000 000000 RR RR  
MM MM TT HH HH HH FF LLLLLLLL 000000 000000 RR RR  
.....  
.....

LL IIIII SSSSSSS  
LL IIIII SSSSSSS  
LL II SS  
LL II SS  
LL II SS  
LL II SS  
LL II SSSSS  
LL II SSSSS  
LL II SS  
LL II SS  
LL II SS  
LL II SS  
LL LLLLLLLL IIIII SSSSSSS  
LL LLLLLLLL IIIII SSSSSSS

MTH  
1-C

(2) 57  
(3) 87  
(4) 146

DECLARATIONS

MTH\$HFLLOOR - greatest integer H\_floating routine  
MTH\$HFLLOOR\_R7 - greatest integer H\_floating routine

```
0000 1 .TITLE MTH$HFLOOR - Greatest integer routine for H_floating
0000 2 .IDENT /1-002/ ; File: MTHHFLOOR.MAR EDIT: RH1002
0000 3 .
0000 4 .
0000 5 :*****
0000 6 :*
0000 7 :* COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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0000 9 :* ALL RIGHTS RESERVED.
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0000 17:*
0000 18:*
0000 19:*
0000 20:*
0000 21:*
0000 22:*
0000 23:*
0000 24:*
0000 25:*
0000 26:*****
0000 27:*
0000 28:*
0000 29:++
0000 30:FACILITY: Math Library
0000 31:
0000 32:ABSTRACT:
0000 33:
0000 34:This routine finds the largest integer less than the input
0000 35:value, i.e. it truncates toward negative infinity
0000 36:for data type H_floating.
0000 37:
0000 38:ENVIRONMENT: User Mode, AST Reentrant
0000 39:
0000 40:--
0000 41:Author: John Sauter, Creation date: 27-JUL-1979
0000 42:
0000 43:MODIFIED BY:
0000 44:
0000 45:VERSION 00
0000 46:1-001 - Original, from MTHSGFLOOR.
0000 47:1-002 - CALL entry was modified to return the result in the address
0000 48:specified by the leftmost argument in order to conform to the
0000 49:calling standard for return values larger than 64 bits. The
0000 50:original version returned the results in R0-R3.
0000 51:JSB entry was modified to correct typos: The last two operands
0000 52:of the EMODH instruction and the operand of the TSTH instruction
0000 53:were changed from R2 to R4.
0000 54:Comments were changed to eliminate an erroneous calling sequence.
0000 55:RNH 9-DEC-1980
```

```
0000 57 .SBttl DECLARATIONS
0000 58 ; INCLUDE FILES:
0000 59 :
0000 60 :
0000 61 :
0000 62 :
0000 63 ; EXTERNAL DECLARATIONS:
0000 64 :
0000 65 .DSABL GBL ; Prevent undeclared
0000 66 ; symbols from being
0000 67 ; automatically global.
0000 68 :
0000 69 ; MACROS:
0000 70 :
0000 71 :
0000 72 :
0000 73 ; EQUATED SYMBOLS:
0000 74 :
0000 75 :
0000 76 :
0000 77 ; OWN STORAGE:
0000 78 :
0000 79 :
0000 80 :
0000 81 ; PSECT DECLARATIONS:
0000 82 :
00000000 83 .PSECT _MTH$CODE PIC, USR, CON, REL, LCL, SHR, -
0000 84 EXE, RD, NOWRT, LONG
0000 85
```

```

0000 87      .SBTTL MTH$HFLOOR - greatest integer H_floating routine
0000 88      ++
0000 89      : FUNCTIONAL DESCRIPTION:
0000 90
0000 91      This routine finds the floor by truncating, and then if the
0000 92      input value is negative and not an integer subtracting 1.
0000 93
0000 94      CALLING SEQUENCE:
0000 95
0000 96      CALL MTH$HFLOOR (result_int.wh.r, input.rh.r)
0000 97
0000 98      : INPUT PARAMETERS:
0000 99
0000 100     input_addr = 8 ; address of the H_floating number
0000 101
0000 102 ; to get the floor of
0000 103      : IMPLICIT INPUTS:
0000 104
0000 105     NONE
0000 106
0000 107      : OUTPUT PARAMETERS:
0000 108
0000 109     output_addr = 4
0000 110
0000 111      : IMPLICIT OUTPUTS:
0000 112
0000 113     NONE
0000 114
0000 115      : FUNCTION VALUE:
0000 116      : COMPLETION CODES:
0000 117
0000 118     NONE
0000 119
0000 120      : SIDE EFFECTS:
0000 121
0000 122     NONE
0000 123
0000 124      --
0000 125
00FC 126      .ENTRY MTH$HFLOOR, ^M<R2, R3, R4. R5, R6, R7> ; entry point
0002 127
54 54 08 50 08 BC 70FD 0002 128      MOVH @input_addr(AP), R0 ; R0/R3 = input argument
00 50 74FD 0007 129      EMODH R0, #0, #1, R4, R4 ; R4/R7 = fraction_part (arg)
50 54 62FD 000E 130      SUBH2 R4, R0 ; R0/R3 = integer_part (arg)
0012 131
0012 132      BGTR 40$ ; if > 0, have correct answer
0014 133
54 73FD 0014 134      TSTH R4 ; look at fraction part
04 18 0017 135      BGEQ 40$ ; if > 0 then 0 < input < 1 and
0019 136 ; we have the correct answer
0019 137 ; if = 0 then input was integer
0019 138 ; and we have correct answer
0019 139
50 08 62FD 0019 140      SUBH2 #1,R0 ; subtract 1 from truncated
001D 141 ; negative non-integer
001D 142
04 BC 50 70FD 001D 143 40$: MOVH R0, @output_addr(AP) ; move result to output address

```

MTH\$HFLOOR  
1-002

H 1  
- Greatest integer routine for H-floatin 16-SEP-1984 01:36:01 VAX/VMS Macro V04-00  
MTH\$HFLOOR - greatest integer H-floatin 6-SEP-1984 11:24:55 [MTHRTL.SRC]MTH\$HFLOOR.MAR;1 Page 4  
04 0022 144 RET

MTH  
2-0

```

0023 146      .SBTTL MTH$HFLOOR_R7 - greatest integer H_floating routine
0023 147      ++
0023 148      FUNCTIONAL DESCRIPTION:
0023 149
0023 150      This is the JSB entry point to MTH$HFLOOR.
0023 151
0023 152      CALLING SEQUENCE:
0023 153
0023 154      JSB MTH$HFLOOR_R7
0023 155
0023 156      INPUT PARAMETERS:
0023 157
0023 158      R0 through R3 contain the input value
0023 159
0023 160      IMPLICIT INPUTS:
0023 161
0023 162      NONE
0023 163
0023 164      OUTPUT PARAMETERS:
0023 165
0023 166      R0 through R3 contain the result value
0023 167
0023 168      IMPLICIT OUTPUTS:
0023 169
0023 170      NONE
0023 171
0023 172      FUNCTION VALUE:
0023 173      COMPLETION CODES:
0023 174
0023 175      NONE
0023 176
0023 177      SIDE EFFECTS:
0023 178
0023 179      NONE
0023 180
0023 181      ;-- 
0023 182
0023 183      MTH$HFLOOR_R7::                                ; entry point
0023 184
0023 185      EMODH   R0, #0, #1, R4, R4                ; R4/R7 = fraction_part (arg)
002A 186      SUBH2   R4, R0                            ; R0/R3 = integer_part (arg)
002E 187
002E 188      BGTR    40$                                ; if > 0, have correct answer
0030 189
0030 190      TSTH    R4                                ; look at fraction part
0033 191      BGEQ    40$                                ; if > 0 then 0 < input < 1 and
0035 192
0035 193
0035 194
0035 195
0035 196      SUBH2   #1,R0                            ; we have the correct answer
0039 197
0039 198      RSB
003A 199      40$: RSB
003A 200
003A 201      .END

```

## MTH\$HFLOOR Symbol table

- Greatest integer routine for H\_floatin J 1 16-SEP-1984 01:36:01 VAX/VMS Macro V04-00 Page 6  
6-SEP-1984 11:24:55 [MTHRTL.SRC]MTHHFLLOOR.MAR;1 (4)

INPUT ADDR	=	00000008		
MTHSHFLLOOR		00000000	RG	01
MTHSHFLLOOR R7		00000023	RG	01
OUTPUT ADDR	=	00000004		

+-----+  
! Psect synopsis !  
+-----+

**PSECT name**

Allocation	PSECT No.	Attributes												
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
00000000 ( 0.)	00 ( 0.)	NOPIC	USR	CON	ABS	LCL	NOSHR	NOEXE	NORD	NOWRT	NOVEC	BYTE		
0000003A ( 58.)	01 ( 1.)	PIC	USR	CON	REL	LCL	SHR	EXE	RD	NOWRT	NOVEC	LONG		

## **! Performance indicators !**

Phase	Page faults	CPU Time	Elapsed Time
Initialization	31	00:00:00.13	00:00:01.98
Command processing	128	00:00:00.51	00:00:07.16
Pass 1	72	00:00:00.54	00:00:01.82
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	50	00:00:00.47	00:00:02.05
Symbol table output	2	00:00:00.00	00:00:00.01
Psect synopsis output	2	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	287	00:00:01.69	00:00:13.07

The working set limit was 900 pages.  
2169 bytes (5 pages) of virtual memory were used to buffer the intermediate code.  
There were 10 pages of symbol table space allocated to hold 4 non-local and 2 local symbols.  
201 source lines were read in Pass 1, producing 11 object records in Pass 2.  
0 pages of virtual memory were used to define 0 macros.

+-----+  
! Macro library statistics !  
+-----+

### Macro Library name

## Macros defined

\$255\$D1A28:[SYSLIB]STABILE-MIB:2

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

**MACRO/ENABLE=SUPPRESSION/DISABLE={GLOBAL - TRACEBACK}/LIS=LIS\$ : MTHFLLOOR/OBJ=OBJ\$ : MTHFLLOOR MSRC\$ : MTHFLLOOR/UPDATE={ENHS : MTHFLLOOR}**

0262 AH-BT13A-SE  
VAX/VMS V4.0

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MTHSIGN  
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MTHFLOOR  
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MTHHTAN  
LIS

MTHIONNT  
LIS

MTHIHNNNT  
LIS

MTHIMAX0  
LIS

MTHHSORT  
LIS

MTHHSINH  
LIS

MTHHTANH  
LIS

MTHHINT  
LIS

MTHMAX1  
LIS

MTHHNINT  
LIS

MTHHSINCO  
LIS

MTHHMOD  
LIS

MTHIGNNT  
LIS